Managing type 2 diabetes

Key messages

- Metformin should be considered in all patients with type 2 diabetes unless contra-indicated
- Sulfonylureas are an alternative for patients in whom metformin is either contra-indicated (including those at risk of lactic acidosis) or not tolerated
- Combination metformin/sulfonylurea is recommended in patients whose blood glucose is controlled inadequately
- Tight control of blood pressure reduces the risks of microvascular and macrovascular diabetic complications
- All cardiovascular risk factors — diabetes, hypertension, smoking, dyslipidaemia, a previous cardiovascular event — need to be managed to optimally reduce the risk of diabetic complications

How to manage type 2 diabetes
Encourage the patient to adopt lifestyle/dietary measures

Lifestyle/dietary measures need to be continued even when drug treatment is required

- Reduce excess weight through diet and exercise:
  - avoid simple carbohydrates
  - reduce fat intake, particularly saturated fat
  - increase consumption of high-fibre foods
  - increase physical activity, taking into account the presence of ischaemic heart disease or foot problems.


Promote smoking cessation

- Quitting smoking needs to be a goal for anyone with diabetes, especially because of their high risk of experiencing a cardiovascular event.
Aim to improve blood glucose control

**Target blood glucose**
- Fasting level ≤ 6 mmol/L
- Random level 4–7 mmol/L
- HbA1c ≤ 7%

**Glucose control (as measured by HbA1c)** progressively declines over time leading to diabetic complications, including mortality.

Consider metformin for all patients with type 2 diabetes, irrespective of their weight, unless contra-indicated.

Consider sulfonylureas for patients in whom metformin is contra-indicated or who are at risk of developing lactic acidosis.

If monotherapy does not provide adequate glycaemic control, a combination of metformin with a sulfonylurea is recommended.

For details of this and the place in therapy of the new oral antidiabetic agents, see NPS News 17: Managing type 2 diabetes.
Monitor blood glucose

The GP: Measure glycated haemoglobin (HbA1c) levels. HbA1c is a subfraction of haemoglobin that binds glucose. When blood glucose is persistently high, the percentage that binds to haemoglobin increases. HbA1c reflects blood glucose control over the preceding 1-2 months whereas random blood sampling is a snapshot in time.

- at least twice a year in patients who are meeting treatment goals and who have stable glycaemic control
- 3-monthly in patients whose therapy has changed or who are not meeting glycaemic goals.

Note: HbA1c results vary between laboratories so the same laboratory should be used for repeated testing.

The patient: Self monitoring. Take into account the patient’s age, need for ideal control and motivation when considering self monitoring.

Blood glucose monitoring is more accurate than urine testing and is preferred.

The optimal frequency of testing in type 2 diabetes is unknown:
- testing at different times of the day, 1-2 days a week is suggested
- the patient should test more frequently when control is likely to be poor (e.g. during illness, after changes in therapy) or when using insulin.

Control hypertension

Target blood pressure

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<th>Without proteinuria &lt; 130/85 mmHg</th>
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<td>With proteinuria (1 g/day) &lt; 125/75 mmHg</td>
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Managing blood pressure reduces the complications of type 2 diabetes

Tight blood pressure control (mean blood pressure over 9 years 144/82 mmHg vs 154/87 mmHg in the less tight control group) has been shown to reduce the risks of microvascular and macrovascular diabetic complications.

More than one antihypertensive agent may be needed to maintain blood pressure at target levels—by nine years over 60% of patients required at least two antihypertensive drugs to maintain tight control of blood pressure and 29% needed three or more agents.

There is no conclusive evidence supporting one antihypertensive drug class over another. The evidence available is derived mainly from post hoc subgroup analyses of patients with diabetes from larger trials not focused on diabetes. Emphasis is given to trials investigating effects on cardiovascular morbidity and mortality.

ACE inhibitors have the largest volume of evidence supporting their efficacy in reducing non-fatal and fatal diabetic complications.

ACE inhibitors reduce urinary albumin excretion in normotensive diabetic patients with microalbuminuria.

Beta-blockers were as effective as ACE inhibitors in reducing the incidence of diabetic cardiovascular complications.

Thiazide diuretics are first-line therapy in mild to moderate hypertension and have proven efficacy in older patients with diabetes.
Calcium-channel blockers are not recommended as first-line agents in diabetes. Calcium-channel blockers (e.g., amlodipine, felodipine, nifedipine) have conflicting evidence, with some trials showing benefits on cardiovascular outcomes while other studies have found an increased risk of myocardial infarction, stroke, and death with calcium-channel blockers. Note that calcium-channel blockers are generally not used in patients who have had a myocardial infarction.

More evidence is required to support the use of angiotensin II receptor antagonists in diabetes. Angiotensin II receptor antagonists have, to date, mainly been shown to lower blood pressure and reduce urinary albumin excretion in diabetes; evidence relating to their effect on diabetic morbidity and mortality is emerging.

Manage dyslipidaemia

**Target**

- Cholesterol: < 5.0 mmol/L
- HDL-cholesterol: ≥ 1 mmol/L
- LDL-cholesterol: < 3 mmol/L
- Triglycerides: < 2 mmol/L

Diabetes has been classified a ‘coronary heart disease risk equivalent’. that is, providing the same level of risk as if the patient has had a prior CHD event.

**Behavioural modification and diet are first-line therapy**

- Measure fasting lipids (preferably without a tourniquet) every 1–2 years if normal or every 3–6 months if either abnormal or on lipid-lowering therapy.
- Weight loss, increased physical activity and improved blood glucose control will improve the lipid profile.
- Assess after a 3–6 months’ trial.

**Drug therapy**

- Evidence for secondary prevention with lipid-lowering drugs in diabetes has only been derived from subgroup analyses from the parent trials with small numbers of diabetic people—although this evidence is not conclusive, lipid-lowering drugs reduced the number of CHD events in people with diabetes.
- Where hypercholesterolaemia is predominant, use an HMG-CoA reductase inhibitor (statin).
- Where hypertriglyceridaemia is predominant, use a fibrate (such as gemfibrozil).
- With mixed hyperlipidaemia, use either a high-dose statin or statin + gemfibrozil.
- In mixed hyperlipidaemia, combining a fibrate with a statin can cause muscle damage with subsequent rhabdomyolysis—specialist advice is recommended.
Which patients with type 2 diabetes should be offered aspirin?

There is insufficient evidence to define precisely which people with diabetes should receive aspirin prophylactically.

Aspirin has proven efficacy in the secondary prevention of CHD and stroke in people with diabetes. However, there is little evidence to support routine primary prevention with aspirin in diabetes: a study in individuals without previous myocardial infarction or cerebrovascular disease found that aspirin did not significantly affect cardiovascular mortality or the risk of stroke during the 5-year follow-up period.

Whether aspirin should be offered to all patients with type 2 diabetes or only those at higher risk of adverse cardiovascular events remains contentious.

In people without contraindications to aspirin use, a dose of 75–325 mg/day has been recommended as prophylaxis against cardiovascular events.

More than one antihypertensive drug is often required to achieve satisfactory blood pressure control. In patients where an ACE inhibitor is used with a thiazide diuretic, the use of NSAIDs (including aspirin) can have a ‘triple whammy’ deleterious effect on renal function.

References:
22. Executive summary of the third report of the National Cholesterol Education Program (NCEP) expert panel on detection, evaluation, and treatment of high blood cholesterol in adults. JAMA 2001;285:2486-97
23. NSW Health Department. The principles of care and guidelines for the clinical management of diabetes mellitus. Sydney: NSW Health Department; 1996